



Water Conservation — Every Drop Counts

The importance of protecting our water resource cannot be overstated. In economic terms, the measurable contribution of water to the Canadian economy is estimated to range between \$7.5 billion and \$23 billion per year. In environmental terms, water is the lifeblood of the planet. Without a steady supply of clean, fresh water, all life, including human, would cease to exist.

Fortunately, Canada is blessed with an abundance of water. However, that abundance has led to misuse and abuse of the resource: from household toilets that use 20 litres per flush where 6 litres would do, to industrial plants — and some municipalities — that use water bodies as convenient sewers.

The quantity, quality and economic problems we face as a result of our use of water are complex but, at least *one* of the causes of these problems is easy to manage — the way we waste water. And, the solution is straightforward — *water conservation*. Simply stated, water conservation means *doing the same with less*, by using water more efficiently or reducing where appropriate, in order to protect the resource now, and for the future. Using water wisely will reduce pollution and health risks, lower water costs, and extend the useful life of existing supply and waste treatment facilities.

And it's easy. With little change to the way we do things now, or the equipment we use, we can reduce water consumption in the home, and in business, by 40% per cent or more. This publication outlines the role of water conservation in addressing problems related to water use and water quality. It also shows us what part we can play as residential consumers in finding solutions.



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Sustaining our water supply

Water is considered a renewable resource: "renewable" referring to that portion which circulates back and forth in the hydrological cycle (described more fully in Freshwater Series A-1, *Water — Nature's Magician*). However, pressures on this resource are growing. For example, between 1972 and 1981, Canada's rate of water withdrawals increased by just over 50 per cent, from 24 billion m³/yr (cubic metres per year) to 37 billion m³/yr. But, our population increased by only 5 per cent over the same period, dramatically illustrating the growth in our thirsty lifestyles. As the readily available supplies of fresh water are being used up, we begin to see that there are real limits to how much water we can count on.

Limiting factors

- ▶ Canada has an abundance of fresh water — one-fifth of the world's supply. Unfortunately, only ten per cent is renewable, as illustrated in Freshwater Series A-2, *"Water — Here, There and Everywhere."*
- ▶ Ninety per cent of the Canadian population lives in a narrow southern band, while 60 per cent of our water supply flows north to the Arctic Circle.
- ▶ Our growing population, and our growing thirst for water, are being concentrated in expanding metropolitan areas, and are forcing water regulators and policy makers to find ways to stretch available supplies even further.
- ▶ Increasing pollution of surface and groundwater is further reducing the supplies of readily available, clean water.
- ▶ Because our water use almost always leads to some degree of deterioration in water quality, the less water we withdraw, the less we upset the natural balance of our aquatic ecosystems. And, the less we upset the ecosystem, the less we have to spend to restore the water quality to an acceptable standard for public use.
- ▶ Finally, financing by municipal governments for the treatment of water supplies and wastewater is becoming increasingly constrained.

We can, however, make a significant contribution to solving these problems by reducing unnecessary levels of water use. To do so requires that we identify the areas within our homes, businesses, buildings and processes where we waste water and then make appropriate changes, either in our fixtures, or in our water-using habits.

How water is used

We use water in many ways, and assign different values to those uses. *Instream* uses (e.g. for transportation and recreation) are valued highly, but it has proven difficult to give them a dollar value that has any real meaning. For example, just what would the average consumer be willing to pay to swim in a clean lake or for a chance to catch fish in a clean, unpolluted river?

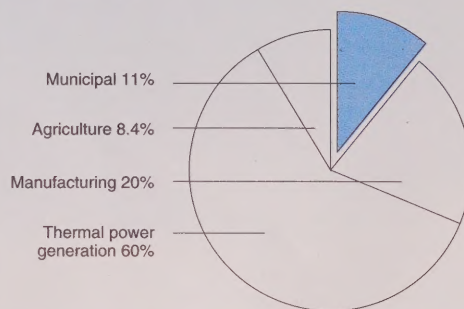
By far the greater number and variety of water uses occur on land. These are called *withdrawal* uses and, although important to our daily lives, they have tended to be assigned a low value. Water is withdrawn, used and then discharged. Most withdrawal uses

"consume" some of the water, which means less is returned to the source than was taken out. And, after it has been used, the quality of the water that is returned is often diminished, which has a negative impact on both the environment and recreational instream uses.

In 1986, four main withdrawal uses accounted for a gross water use in Canada of 56.5 billion m³ — over a 50 per cent increase from the 1981 levels mentioned above. These uses are described more fully in Freshwater Series A-4, *"Water Works!"* and are briefly described below (Figure 1).

Figure 1

The four main water users in Canada



Thermal power generation includes both conventional and nuclear power generating plants, which withdrew slightly more than 60 per cent of the total water intake in 1986.

Manufacturing accounted for 20 per cent of water withdrawals in 1986. Food and beverage, chemicals, paper and allied products, metal mines, and mineral fuels were the main industrial users.

Agriculture accounted for 8.4 per cent of total withdrawals. Water is used primarily for irrigation, with Alberta, Manitoba and Saskatchewan accounting for 95 per cent of all irrigation demand. Since the majority of irrigation water evaporates, only a small fraction is returned to its source.

Municipal use accounted for 11 per cent of all water withdrawals in 1986. In the municipal sector, about 45 per cent of the water demand is a result of residential use (Figure 2).

Sustaining our infrastructure

While many communities have access to an abundant water supply, the costs of the infrastructure that provides homes and industry with water and sewer services are straining the available municipal financial resources.

By *infrastructure*, we mean the *water treatment plants* that purify our water, the *water mains* in the ground that transport water, and the *towers and reservoirs* that store water. The term also includes the *sewer pipes* that carry away wastewater and the *sewage treatment plants* that

Solutions — the municipal challenge

Municipal governments across Canada are beginning to take action to manage the demand for water, instead of seeking new sources of supply. *Demand management*, incorporating water efficient applications, is rapidly gaining popularity as a low cost, effective way to get more service out of existing systems, thus delaying or deferring the need for constructing new works. The benefits of water efficient techniques apply equally well to rural, private wells and septic disposal systems, as they do to central water and sewer systems in the city.

The wide range of water efficiency initiatives currently being undertaken, can be grouped under four principal categories: 1) Structural 2) Operational 3) Economic and, 4) Socio-political.

Most of these water conservation activities fall within the jurisdiction of municipal governments and/or public utilities.

Structural

- ▶ metering
- ▶ water recycling systems
- ▶ wastewater re-use
- ▶ flow control devices
- ▶ distribution system pressure reduction
- ▶ water saving devices (efficient fixtures, appliances and retrofits)
- ▶ drought resistant landscaping (xeriscaping)
- ▶ efficient sprinkling/irrigation technology
- ▶ new process technologies

Operational

- ▶ leak detection and repair
- ▶ water use restrictions
- ▶ elimination of combined sanitary/storm sewers to reduce loadings on sewage treatment plants

Economic

- ▶ rate structures
- ▶ pricing policies
- ▶ incentives through rebates and tax credits
- ▶ other sanctions (fines)

Socio-political

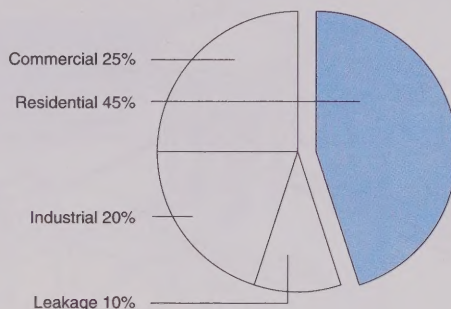
- ▶ public education
- ▶ information transfer and training
- ▶ regulatory (legislation, codes, standards and by-laws)

treat wastewater before returning it to the environment where it often becomes the source of water for communities downstream (Figure 3).

Experts are predicting a growing problem involving municipal water and sewer infrastructure in Canada. In 1991, the value of this investment was estimated to be worth over 100 billion dollars, of which a significant amount is deteriorating with age.

Figure 2

Municipal water use by sector



An increasing number of Canadian municipalities are considering water conservation as the key to keeping expansion needs to a minimum. Water conservation also optimizes plant efficiency, while assisting municipalities in financing the replacement of infrastructure that may be over 50 years old in some communities and up to 100 years old in several others.

Communities with older systems in need of extensive repairs or replacement face the most difficult problems. With all levels of government adopting policies of realistic water pricing and user pay principles, many municipalities have instituted *full cost pricing* to recover the total cost of providing both water and sewer services — including the costs of financing the replacement of older systems and the upgrading of overloaded treatment plants. Higher municipal costs, in turn, mean higher water — and sewer — bills for all consumers.

The problem of stressed treatment systems is not restricted to communities with piped water and sewer systems. Over the past quarter century, there has been a substantial migration of urban dwellers to the countryside. City-bred water using habits and attitudes are, in many instances, lowering the water table. And, the flood of wastewater produced is stressing the soil's ability to treat septic effluent adequately. More disturbing is the

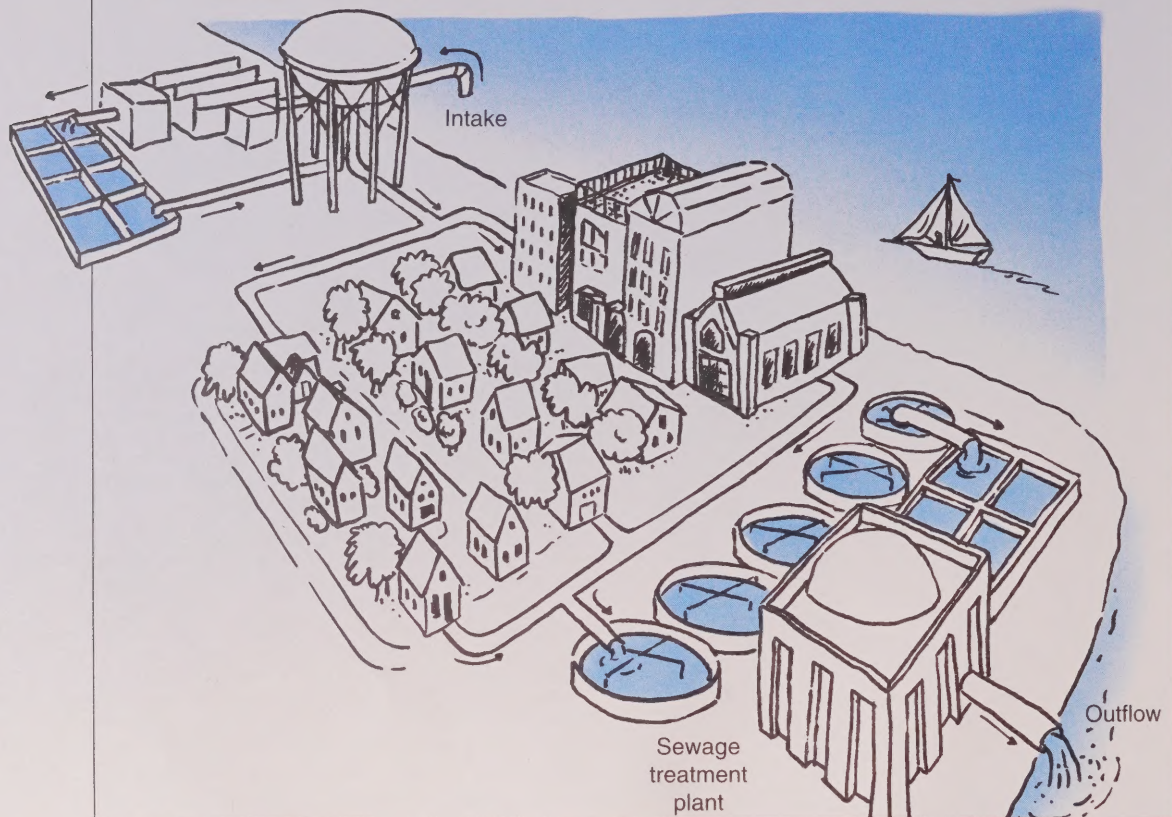
Metering

Tied to price increases, metered households generally show reductions in water-use of 20 per cent or more, with the greatest savings occurring during the summer months, when water use is usually much higher due to frequency of lawn watering, car washing and other outdoor uses. And yet, only about 55 per cent of Canada's *urban* population was metered in 1989.

Metering of industry has been common for some time. What's new is the metering of the return flow to the sewer system. Case studies show that including sewage treatment in rate calculations generates greater water savings. An increasing number of municipalities are applying sewer surcharges to residential water bills.

Figure 3

Municipal water supply and sewage treatment



Water efficient residential technology

Up to 45 per cent of municipal water is used by the residential sector. As a consequence, the residential sector represents a logical target for demand management activities. Depending on the nature of the water efficiency program developed, each household can reduce water use from 10 to 40 per cent.

Leak detection and repair

From 10 to 30 per cent of the total water entering supply-line systems is lost to leaking pipes. In most cases, if *unaccounted for* water in a municipal system exceeds 10 to 15% (Figure 2), a leak detection and repair program is cost-effective. For example, studies have shown that for every \$1.00 spent in communities with leak detection programs, up to \$3.00 can be saved.

Rates, pricing and public education

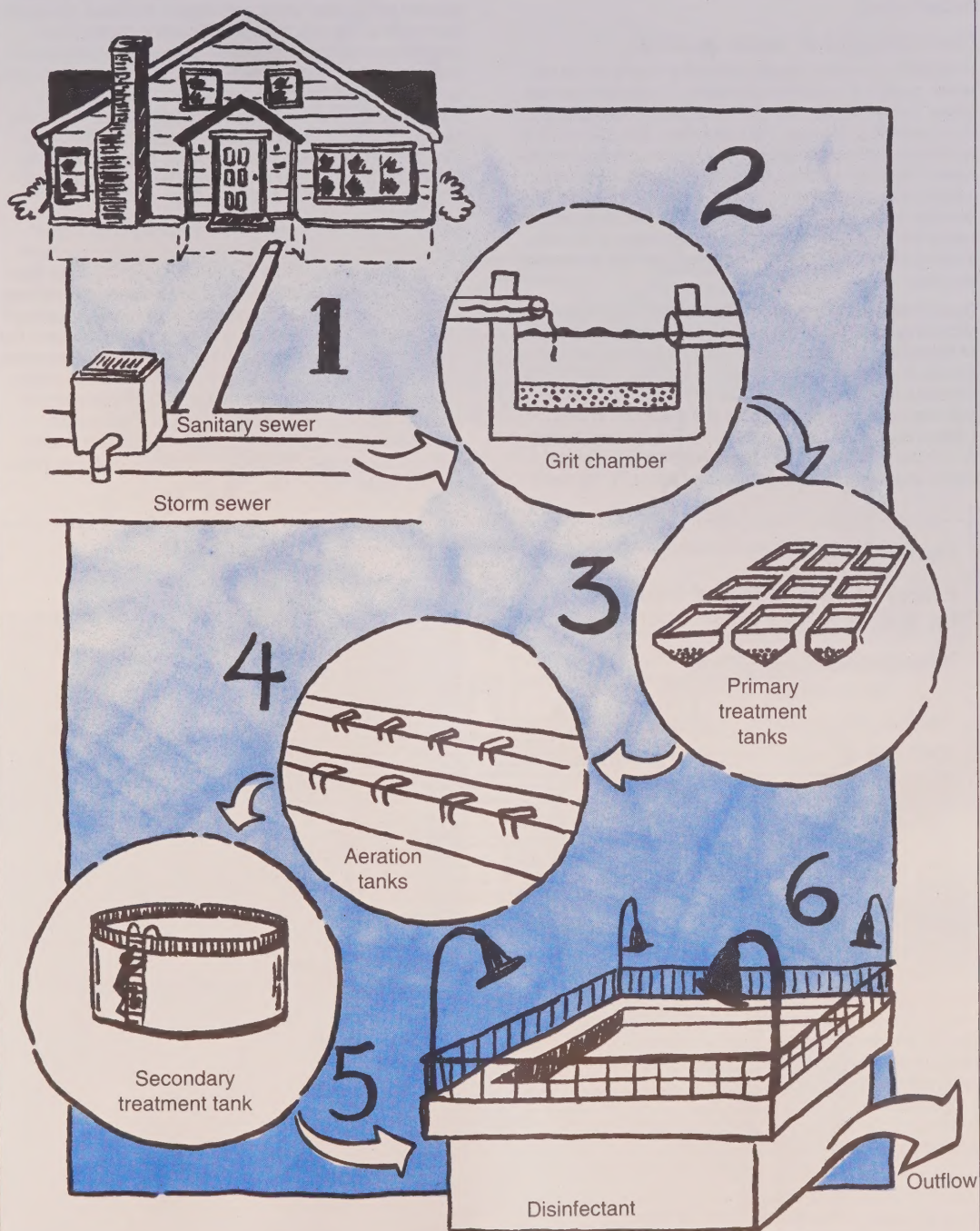
About 70 per cent of Canadians pay water rates that do not promote conservation. A 1987 study of rate structures by Environment Canada showed that 37 per cent of the population was under a *flat rate* structure (a fixed charge regardless of the amount of water used). Another 34 per cent were under a *declining block rate* structure (where the consumer's bill rises at a slower rate as higher volumes of water are used; i.e., the more you use, the less you pay per unit).

Only about 30 per cent of the population was found to be under a rate structure that provided an incentive to conserve water: 27 per cent were under a *constant rate* structure (where the bill to the consumer climbs uniformly with the volume used); and 2 per cent were under an *increasing block rate* structure (where a successively higher price is charged as larger volumes of water are used).

Raising the price has reduced water use in some jurisdictions, but it must be accompanied by a well articulated public education program that informs the consumer what to expect.

Figure 4

Typical sewage treatment process in Canadian municipalities



existence of close to two million septic systems in Canada, up to 30 per cent of which are failing due to poor construction and inadequate maintenance.

For both urban and rural communities, water conservation can extend the life of this overstressed infrastructure.

Sustaining our water quality

In addition to water supply and infrastructure issues, water quality is a problem in many Canadian communities. Generally speaking, the decline in water quality is a function of the way we use water. Even something as simple as rinsing dishes in the kitchen creates wastewater that is contaminated to some degree. Once this water enters the sewer system, it must be treated in a sewage treatment plant (Figure 4). These facilities are never 100 per cent effective, which means that some water quality deterioration remains after the treatment process.

Specific causes of impaired water quality are numerous, including: agricultural runoff containing the residues of fertilizers, pesticides and other chemicals, industrial pollution, either directly from the facility, or indirectly from the leaching of chemicals from landfills, or pollution from average households in the form of improperly treated municipal sewage (refer to Freshwater Series A-3, "Clean Water — Life Depends on It"). An even more unsettling statistic is that only about 70 per cent

of urban Canadians were served by wastewater treatment plants in 1989. For the other 30 per cent of urban Canadians, their municipal wastewater flows *untreated* back into the water source!

For the roughly 25 per cent of the Canadian population served by private wells and septic disposal systems, the news is not much better. These systems were originally designed for houses that were widely separated from their nearest neighbour, such as farmhouses and the occasional rural residence. Yet, today, in many parts of the country, individual private wells are being installed in subdivisions at suburban densities. The primary danger here is that too many wells may pump too much water for the aquifer to sustain itself (Figure 5).

Septic treatment systems associated with these developments can stress the environment in a number of other ways. They are often allowed in less than satisfactory soil conditions and are seldom maintained properly. They are also unable to treat many household cleaners and chemicals which, when flushed down the drain or toilet, often impair or kill the bacterium needed to make the system work (The same applies in urban systems). The end results are improper treatment of wastewater — if not outright failure of the system — and the contamination of adjacent wells with septic effluent containing bacterium, nitrates and other pollutants (Figure 6).

Figure 5

Effect of concentrated housing on groundwater level

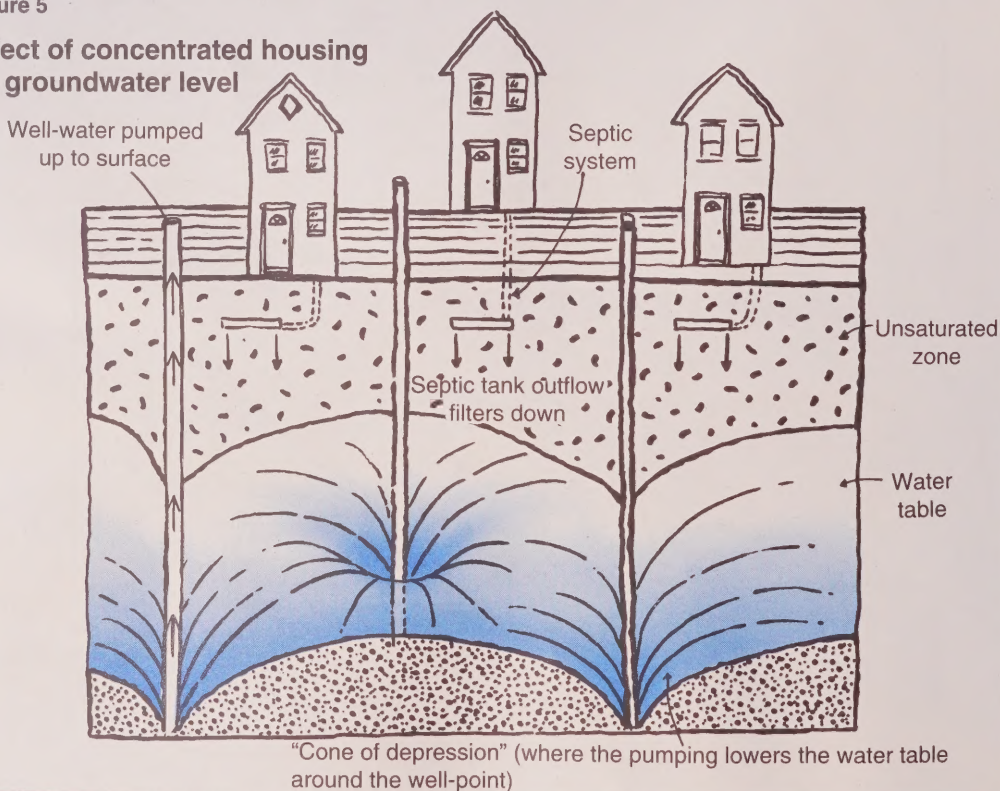
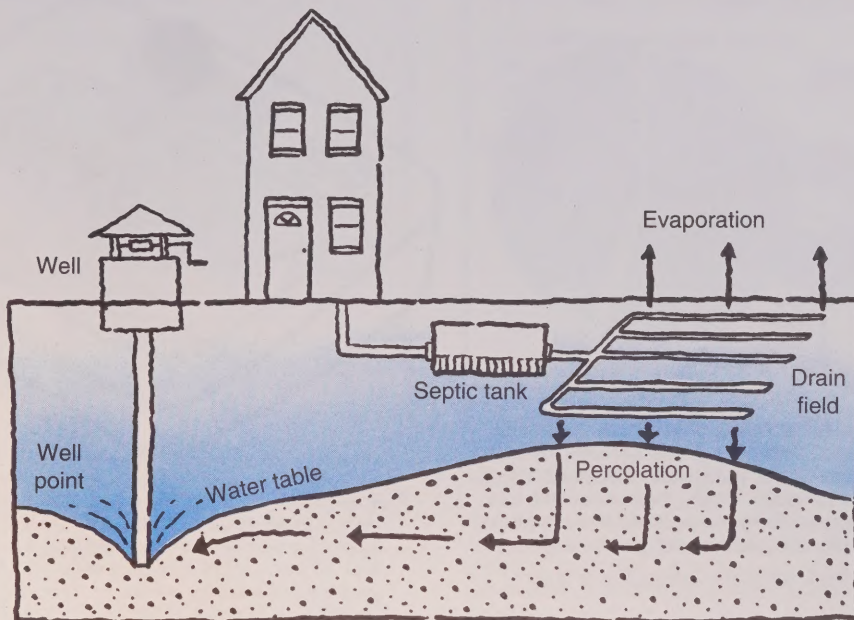


Figure 6

Septic effluent percolates to the water table



Solutions — in the city and in the countryside

The irony in all of this is that water quality impacts from overloaded or poorly maintained and operated municipal and private sewage disposal systems are the number one preventable type of pollution in Canada. The answer lies in better, more thorough treatment. And, one of the ways to enhance the treatment process is to limit the amounts of wastewater entering the wastewater stream. Again, water conservation is one of the easiest and cheapest ways to reduce the volume of wastewater flows and improve water quality.

Following a few common sense rules, it should be possible to safeguard your water supply while extending the life of your sewage disposal system, regardless of whether you live in the country or in the city.

Think carefully about the quantities of wastewater your household or business produces, as well as the quality of the wastewater. Do you make it a habit of discarding solvents, cleaners and related chemicals down your drains? If you do, you may be introducing substances that are toxic to the bacterium and other organisms that play a vital role in the treatment of sewage. This statement applies equally well to urban and rural households and businesses.

Once these contaminants are in the groundwater, they eventually reach rivers and lakes. In other words, once we have a *pollution* problem, we may be only a step away from a *water supply* problem.

Individual action – conserving water in the home, community and at work

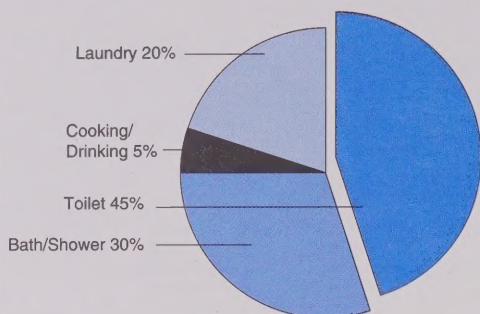
As we have seen, water quality and quantity are two sides of the same coin. How does saving water help water quality? Because water saved is water that does not end up in the wastewater stream requiring treatment. This, in turn, reduces municipal pumping and treatment costs and frees up monies that can be used for infrastructure renewal and replacement and protection of supply sources. Less wastewater in the sewage treatment plant also means that the plant has a better chance of doing the job it was intended to do.

So, where do we start? The first step is to identify *where* we use water in the home. Then we need to decide on *what* to do to reduce the amount of water we use, either by eliminating wasteful practices and habits, or by improving the efficiency of our water using fixtures and devices. Since we waste so much, this should be a relatively easy and painless process. The prime area to target is the bathroom, where nearly 75 per cent of all indoor water use occurs (Figure 7).

What follows are some suggestions for how to get your house or business in order. Based on the three rules of water conservation — *reduce*, *repair* and *retrofit* — a typical household can reduce water consumption by forty per cent or more, with little or no effect on lifestyle.

Figure 7

Where water is used inside the home



Reduce:

Much of the water “consumed” in our daily activities is simply wasted. Taps are left running while we brush our teeth. Dishwashers and laundry machines are operated without full loads. Really, everywhere we use water there is room for improvement. Here are just a few examples for both indoor and outdoor water use.

- ▶ Don't use the toilet as a wastebasket or flush it unnecessarily.
- ▶ A quick shower uses less hot water than a full tub (and saves energy too).
- ▶ Keep a bottle of drinking water in the fridge rather than letting your tap run to get cold water when you want a drink. (Rinse the bottle every few days.)
- ▶ More than fifty per cent of the water applied to lawns and gardens is lost due to evaporation, or run-off because of overwatering. Find out how much water your lawn really needs. As a general rule, most lawns and gardens require little more than 2.5 cm of water per week.
- ▶ To reduce losses due to evaporation, water early in the morning (after the dew has dried). Do *not* water in the late afternoon. For most municipal water utilities, this is their *peak demand* period. Watering *off-peak* helps the utility manage its load on the system and helps ensure adequate reservoir levels and water pressure for possible fire emergencies.
- ▶ When washing a car, fill a bucket with water and use a sponge. This can save about 300 litres of water.

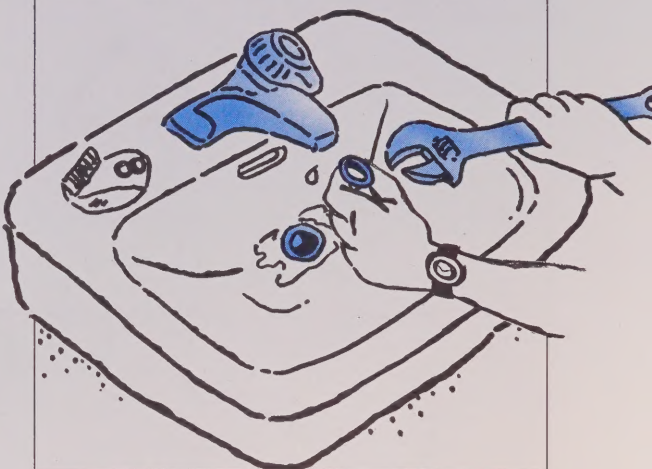
Repair:

Leaks can be costly. A leak of only one drop per second wastes about 10 000 litres of water per year. Most leaks are easy to find and to fix, at very little cost (Figure 8).

- ▶ Leaking faucets are often caused by a worn-out washer that costs pennies to replace. Most hardware stores will have faucet repair kits with illustrations showing how to replace a washer.

Figure 8

Making repairs – saving money



- ▶ A toilet that continues to run after flushing, if the leak is large enough, can waste up to 200 000 litres of water in a single year! And it's estimated that *40 per cent of all toilets leak*. To find out if your toilet is leaking, put two or three drops of food colouring in the tank at the back of the toilet. Wait a few minutes. If the colour shows up in the bowl, there's a leak.
- ▶ Toilet leaks are often due to a flush valve or flapper valve that isn't sitting properly in the valve seat, bent or misaligned flush valve lift wires, or a corroded valve seat. All of these can be fixed easily and inexpensively. To get at the valve seat, which surrounds the outlet hole at the bottom of the tank, you must first empty the tank (Figure 9). This is accomplished by turning off the inlet tap under the tank and flushing the toilet, making sure to keep depressing the flush lever until no more water drains out of the tank. Then, holding the valve out of the way, sand the corroded or warped valve seat smooth with a piece of emery cloth. If, however, the leak is around the base of the toilet where it sits on the floor, call a professional.

Retrofit:

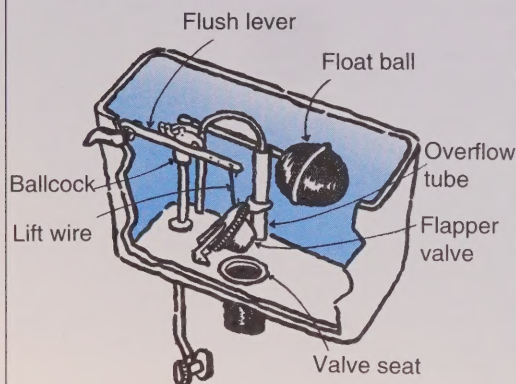
Retrofit means *adapting* or *replacing* an older water-using fixture or appliance with one of the many water-efficient devices now on the market. While these solutions cost more, they also save the most water and money. Retrofitting offers considerable water saving potential in the home and in business, so this issue on the Freshwater Series is devoting considerable space to it.

1) Toilet retrofits

When it comes to retrofitting, the prime fixture to target is the toilet. You can: i) *adapt* your existing toilet in a number of ways, by installing certain water-saving devices inside the tank at the back of the toilet; or, ii) if the toilet is more than ten or fifteen years old — which

Figure 9

Inside the toilet tank



means it probably uses about 20 or more litres of water per flush — you can *replace* it with one of the growing number of ultra-low-volume (ULV) toilets, that can be ordered from most plumbing supply outlets, and use only 6 litres or less per flush.

There are many *toilet adaptations* you can install in the tank of an existing toilet to reduce the amount of water used in a flush cycle. These devices fall into three generic categories:

- ▶ water retention devices;
- ▶ water displacement devices; and,
- ▶ alternative flushing devices.

The most common water retention device available is the *toilet dam* (Figure 10). A set will save about 5 litres per flush when installed properly. Their main attraction is their low cost (under \$10.00 per set) and the fact that they are easy to distribute and install: for example, as part of a wider municipally-sponsored retrofit program. Their main disadvantage is that they tend to leak over time by slipping out of adjustment and can slip free and interfere with the moving parts inside the toilet tank, if not routinely checked.

The water displacement devices familiar to most people are the *plastic bags or bottles* filled with water which are suspended inside the toilet tank (Figure 10). As the name implies, these devices displace several litres of water, saving an equivalent amount during each flush. Like the toilet dam, most displacement devices are inexpensive and easy to install. Their chief disadvantage is that they don't save as much water as other devices and, if they are not installed carefully, they can interfere with the proper operation of the toilet.

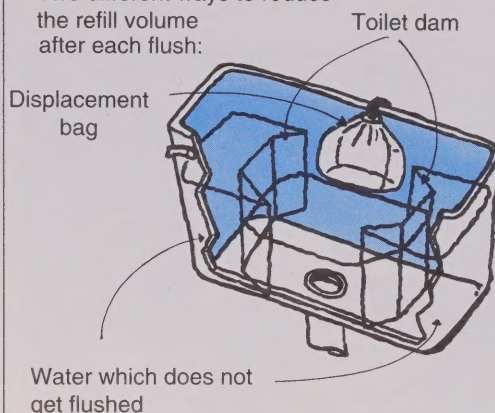
One displacement device to stay away from is the *brick!* It can disintegrate inside the toilet tank, leading to excessive leakage at the flapper valve and may even be heavy enough to actually crack the tank.

There are essentially two types of alternative flush devices: *early-closure* and *dual-flush*. They are usually attached to the overflow tube inside the toilet tank (Figure 9). In both cases, they close the flush valve or

Figure 10

Toilet dam and displacement bag

Two different ways to reduce the refill volume after each flush:



flapper after the tank is only partially emptied. In theory, this interruption in the flush cycle occurs after the bowl has been cleared. In the case of the dual-flush mechanism, the amount of water saved is dependent upon how long the flush lever is activated — a partial flush for light duty or a full flush for heavy duty.

While all of the above toilet adaptations appear to work as intended when first installed, their *performance* may vary considerably, depending on the toilet design. The best advice is to monitor the performance of the devices periodically. If you discover that it becomes necessary to double flush the toilet, something is in need of adjustment or replacement. Remember that double flushing defeats the purpose of your water conservation efforts and is costing you money.

If you decide that it is time for a *toilet replacement* in your home or business, you are well on your way to significant water savings that you can bank on over the life of the toilet. Replacing a 20 litre per flush toilet with an ultra-low-volume (ULV) 6 litre flush model represents a 70 per cent savings in water flushed and will cut indoor water use by about 30 per cent (Figure 11). Keep in mind that 20 litres per flush, assuming 4 flushes per person per day, translates into nearly 30 000 litres of clean, fresh water per year just to get rid of 650 litres of body waste. A 6 litre flush toilet will only use about 9000 litres to do the same task. Low-flush toilets are available for less than \$150.00 at most plumbing and supply stores.

Remember, the ULV toilet not only uses less water, it *produces less wastewater*. If your municipality applies a *sewer surcharge* on your water bill, the investment in the better toilet could translate into a 50 per cent reduction in your combined water/sewer bill! If you are on a private well and septic system, you are significantly reducing the loading on your tile field while extending its useful life. To a lesser degree, the same applies to the other water-saving devices described in this publication.

Figure 11

Water use per flush — conventional vs. ULV toilet



2) Showerheads and faucets

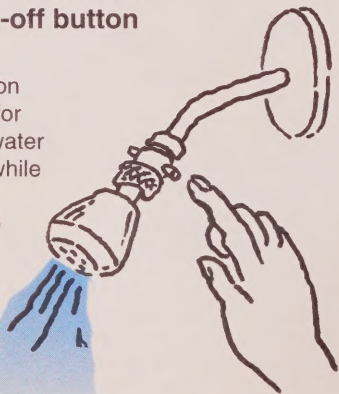
After the toilet, the shower and bath consume the most water inside the home. Conventional showerheads have flow rates up to 20 litres per minute. A properly designed *low-flow showerhead* can reduce that flow by half and still provide proper shower performance. Low-flow showerheads can be purchased in most plumbing supply outlets.

Depending on your preference for finish and appearance, you can select a serviceable low-flow showerhead starting at around ten dollars. Consider one with a *shut-off button* (Figure 12). The advantage of the shut-off

Figure 12

Low flow showerhead with shut-off button

Shut-off button
(convenient for
shutting off water
temporarily while
soaping or
shampooing)



button is that it allows you to be really water efficient if you so choose, by being able to interrupt the flow, while you lather up or shampoo, and then resume at the same flow rate and temperature.

Beware of the cheap commercial-type showerheads that produce such a fine mist that the water is quite cool by the time it reaches your feet. And, stay away from so-called *flow restrictors* that are inserted inside your existing showerhead. They look like a small plastic washer and can produce a fierce, stinging spray pattern which may significantly reduce the enjoyment of taking a shower.

Conventional faucets have an average flow rate of 13.5 litres of water per minute. Install *low flow aerators* to reduce this flow. In the bathroom, a flow rate of 2 litres per minute should do the trick, and in the kitchen a flow rate of 6 to 9 litres per minute is sufficient. Don't bother retrofitting the tap in the utility sink; it is intended to provide large volumes of water quickly, for example, for cleaning or washing, such that low flows will only inconvenience the user.

3) Outdoors

During the growing season water use can increase by as much as 50 per cent. While lawns require a lot of care, much of this water is wasted — lost due to over-watering and evaporation (see **Reduce**).

Watering equipment also plays a part in how much water is saved and lost. Ideally, sprinklers should be suited to the size and shape of the lawn. That way, you avoid watering driveways and sidewalks. Installing timers on outdoor taps can be a wise investment.

Sprinklers that lay water down in a flat pattern are better than oscillating sprinklers which lose as much as fifty per cent of what they disperse through evaporation. Drip irrigation systems which apply water only to the roots zone are the most efficient — and the most expensive — alternative.

The water you use to water your lawn doesn't have to come out of a tap. A cistern, which captures and stores rainwater, can be used as a source of irrigation water. A rain barrel can adequately fulfill this function.

Finally, consider a low-maintenance landscape — one which requires little more water than nature provides (Figure 13). Often called *xeriscaping*®, the principles of a low-maintenance landscape are as follows:

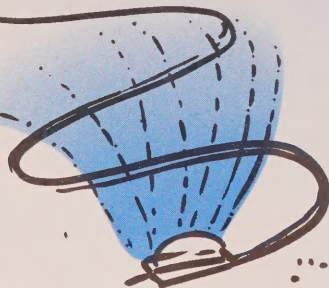
- ▶ a reduced amount of lawn;
- ▶ proper plant selection making use of native grasses, shrubs and trees;
- ▶ mulching to reduce evaporative losses around shrubs and trees;
- ▶ improvements to soils;
- ▶ a proper irrigation system; and
- ▶ planned maintenance.

The most significant savings of course, come from a reduction in lawn area and switching from exotic plant forms to native species which require less water. In general, lawn areas should not exceed what is useful for play and social activities, and should be limited to the backyard where the family spends the majority of its time.

Figure 13

Saving water outdoors

Before
(large expanse of lawn and excessive water use)



After
(water efficient landscaping and watering by hand)

Solutions — at work and in the community

Many of the suggestions made for reducing water use in the home have wider application, both in the workplace, and in the community at large. Low-flow equipment are available for most commercial and toilet applications. Instituting them may mean taking a leading role yourself, for example, forming and leading a committee that would address the following questions:

- ▶ do your workplace bathrooms, kitchens, etc. have water-efficient toilets, faucets, etc. similar to those discussed for the household?
- ▶ if your workplace uses water in its production process or for washing goods or equipment, is this being done efficiently?
- ▶ does your community have a water-efficiency assistance program that helps households and business improve their water-use efficiency?
- ▶ is the water distribution system properly maintained so that no pollution leaks into it and so that no water is wasted through leaky mains?

The Bottom Line

Water conservation. The message is clear. If we each save a little, it can add up to major savings in water, energy and money. For the average household, reductions in water use as high as 40 per cent or more are feasible, just by following the steps outlined in this issue in the Freshwater Series.

The benefits don't stop at the household or business. The municipal water and sewer department gets a break on the amount of water it has to pump to our homes and businesses *and* on the amount of wastewater it has to treat in sewage treatment plants. Water conservation can extend the useful life of municipal water supply and treatment plants, and will benefit the operating efficiency — and life expectancy — of private septic disposal systems.

And, finally, water conservation can generate *significant* environmental benefits. It can reduce water diverted and the pollution loadings on our lakes and rivers by reducing the volumes of wastewater which we have to treat. This can help to protect our drinking water *and* the ecological balance in sensitive aquatic ecosystems.

If we all practice water conservation, everyone — and everything — benefits.



Printed
on paper
that contains
recovered waste

Diving beneath the surface

Environmental Citizenship is an initiative of Canada's Green Plan. Its goal is a society where individuals and groups have the knowledge and values which will help them take responsible environmental action. The objective of the Freshwater Series is to provide a basic understanding of the issues and concerns that relate to water in Canada. For more information please write or call the Environment Canada office nearest you or:

Enquiry Centre
Environment Canada
Ottawa, Ontario
K1A 0H3

Tel.: (819) 997-2800
Toll free: 1-800-668-6767
Fax: (819) 953-2225

For further information, contact your municipal water supplier. Another source of information is the guide, "Water: No Time to Waste — A Consumer's Guide to Water Conservation," which is available at local book stores for \$1.95, or from:

Canada Communication Group
Ottawa, Ontario
K1A 0S9

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